

# A tour of some alternative energy homes in the Pacific Northwest

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**A** growing number of people operate homes, and even businesses, with electrical power of their own making. Some do it by choice, others by necessity, but a few common traits prevail among these folks, with environmental consciousness and independence topping the list.

A tour through a few alternative energy homes in the Pacific Northwest reveals modern-day conveniences as well as efficiency and awareness concerning energy usage.

## Cost a factor in choosing alternative energy

One of the most common reasons for going the alternative energy route in this region is cost. For homes that are located back in the woods or high on a mountain, the cost of running conventional power from the nearest line can be prohibitive.

My own home north of Priest River, Idaho, sits half a mile from the county road and power lines. To run the power company's electricity to my house would cost almost \$8000, which is not an uncommon figure for many living off the beaten track.

One alternative energy user, Joel Jacobsen of Spring Valley, Washington, reported that cost was one of his original reasons for going solar electric 16 years ago when he built his house.

## A philosophical choice

"But more than the money, it was philosophical," he said, "a matter of not wanting to buy into The System."

The federal Renewable Energy Tax Credit in effect from 1976-1986

allowed a tax deduction for those using renewable energy sources (wind, solar, hydro, geothermal).

"We need something like that again," said Jacobsen, who feels that this financial incentive helped encourage the use of alternative energy sources.

## Idaho helps AE users

Idaho is one state that has an Alternative Energy Devices Deduction on its state income tax. Over the course of four years, 100 percent of the cost of an alternative energy system used in a personal residence can be deducted from the user's income.

"Solar energy is environmentally clean," my husband, Tim Chamberlain said. He moved to the Priest River area in 1979 with the idea of becoming autonomous, a dream that together we

are striving to achieve. For Tim, it was never a question of using anything but his own power. According to him, "The benefits of energy independence far outweigh being plugged into the power company."

One of those benefits includes never experiencing local power outages. While neighbors may be without electricity for hours at a time, we stay comfortable in our independently powered home, unaware of the thawing freezers, warming refrigerators, unflushed toilets, and candlelit rooms that others are experiencing. I can sit typing away at my computer, warm and toasty next to the wood stove.

Joel Jacobsen agrees. "One of the nicest feelings," he said, "is to look out over the valley below and see no lights, while I'm inside watching TV."

## Looking to the future

Mel and JoAnn Goldberg, of Newport, Washington, are going about things a bit differently than most. They are converting their conventionally powered home to solar electric.

"It isn't practical for us to go for alternative power, because there's no



A wind generator provides some of the electricity for the home of Mary Sterling and Darrell Johnson at Sacheen Lake, Washington.

way I can produce it cheaper than PUD (his local power company)," Mel said. He doesn't feel that his investment, which has been close to \$12,000, will pay off financially. Instead, he is anticipating a time in the future when power shortages might be common. He foresees a collapse of the electrical distribution system, and wants to stay on top while it's still possible to acquire an alternative system.



*The author working at a computer powered by photovoltaic modules.*

"I'm looking at it from an extremist point of view," he laughed, "without being an extremist."

Golberg built his home in 1977 with energy efficiency and independence in mind. Wood is used for heating the house and water, as well as for cooling. The Goldbergs use a propane cookstove during the summertime.

The system Tim and I use, as well as those of Jacobsen and Goldberg, consists of photovoltaic panels which convert sunlight to direct current (DC) electricity. The electricity is stored in deep cycle batteries to make power available full time. The batteries can be used directly to run 12-volt lights and appliances. An inverter is plugged into the system, transforming the DC battery power to 110-volt alternating current (AC) power. This allows the use of most household appliances and tools.

Major heating appliances which use large amounts of electricity, such as cookstoves, water heaters, and clothes dryers, are more efficiently run with propane or wood in a solar electric

home. Conventional refrigerators and freezers have high power consumption, so energy efficient 12-volt or propane ones make more sense. Tim and I utilize outdoor radiant cooling for refrigeration, and wood for heating water and the house.

In this part of the country, most solar users have a backup system for those months when the sun is scarce. A generator with a battery charger is often used. In our case, the electrical charging system of our car is utilized. We simply connect our deep cycle batteries to the car's alternator via a long cord, and let it idle for a few hours each week. Tim is now in the process of building a steam-powered electrical generator which will eventually serve as our backup power and produce hot water.

We estimate that solar energy meets about 70 percent of our electrical needs, supplying 100 percent of our power for nearly eight months of the year, and about 30 percent in the worst months of winter. Jacobsen gives the same figures for his system's efficiency.

For the system used in our 600 square-foot home, which serves the two of us, we've invested \$4500. This includes an AC inverter, 24-amp photovoltaic panels and the solar tracker (a device which follows the sun) on which they are mounted, 12-volt deep cycle batteries, a DC submersible water pump and the 6-amp solar panels to power it, wiring, 12-volt light fixtures, controls, and the backup generator.

Tim knew enough about electricity and photovoltaics to assemble our entire system himself, keeping costs down. He made our solar panels from 560 individual photovoltaic cells, and designed and built the tracker. We purchased our batteries directly from the phone company (which periodically sells good used ones), purchased some components from Backwoods Solar Electric Systems, and acquired others from individuals who were modifying their own systems.

For a larger system, such as in Jacobsen's 2400 square-foot home

which houses two adults and two teenagers, the cost of such a system could run closer to \$10,000.

## **20-year investment**

We shouldn't have to replace anything in our system for at least 20 years, at which point we may need new batteries. We have no monthly bills to pay, and very little maintenance involved. What maintenance we do have consists of periodically checking the batteries for charge, occasionally adding to their electrolyte level, and shoveling snow from the panels on sunny winter days, simple tasks which require only a few minutes each.

Energy conservation is something we are always aware of, but it doesn't interfere with or dominate our lives. Lights are switched off when not in use, the hot water tank is covered with thick insulation, and we shop around to find the most energy efficient model when purchasing any new electrical item. Our well delivers plenty of water for our needs, but none of it is wasted.

## **A different system**

Darrell Johnson and Mary Sterling live with their two daughters at Sacheen Lake, Washington. Because it would be cost-prohibitive to bring conventional power to their home, they employ an alternative energy system, but theirs doesn't include solar. Once a day, they turn on a gas generator and start their "Power Hour." They vacuum, do laundry, charge their 12-volt deep cycle batteries, and run the pump from their well to an indoor water storage tank during that hour.

Their lights work directly off the batteries, so can be used anytime. Water is heated with propane during the warmer months, and in the winter-time is run through tubing connected to their wood stove. Water is gravity fed from the holding tank upstairs to the kitchen and bathroom below.

They use a propane refrigerator and stove, and spend about \$300 a year on propane. For the generator, they use about three gallons of gas per week. They also have a wind generator,

which produces a small amount of electricity. But because they don't get much wind where they live, it isn't a reliable source of power for them.

Cliff Stansell lives in the woods twelve miles north of Priest River. For ten years he and his wife and two children got by using kerosene lamps, wood heat, and a propane stove and refrigerator in their log cabin home. Cost was the main reason they never hooked up to the power company.

Then Cliff decided to move his custom saddle-making business from his shop in town to his home. His sewing machines all had treadle options, so he could have managed without electricity for the shop, but decided power would be a benefit. Now both his home and adjacent shop run off the electricity produced from photovoltaic panels, stored in 12-volt batteries, and run through an inverter.

### **Making a living with PV**

Steve and Elizabeth Willey, of Sandpoint, Idaho, not only use alternative energy, they earn their living from it.

"A lot of what we do is education," said Elizabeth from their mountaintop home equipped with almost every kind of alternative power device available. They started their business 15 years ago, when after converting to alternative energy themselves, they realized there was a need for both education and supply sources concerning alternative power.

Now they do business throughout the United States as well as internationally, and keep busy filling orders, giving advice, explaining, and occasionally installing alternative energy systems. They publish a newsletter and a planning guide, both of which introduce people to independent alternative energy usage.

Living without the electric company may not be for everyone. As Elizabeth Wiley explained, "We emphasize that it's not just a question of changing to your own power, it's also a question of being aware of what you're using and how you use it." Δ



*The author using a hydrometer to test the charge on the used telephone company batteries in which the electricity is stored. Each battery weighs 400 pounds.*

